

WHAT IS CLAIMED IS:

Sub B1 1. A method for guiding the selection of a therapeutic treatment regimen for a patient with a disease or medical condition, said method comprising:

(A) providing information about the methylation status at selected sites of the DNA of the patient to a computing device comprising:

a first knowledge base comprising information about a plurality of different methylation statuses at selected sites of the DNA in cells with a known disease or medical condition and/or healthy cells,

a second knowledge base comprising a plurality of expert rules for evaluating and selecting a type of disease or medical condition based on the methylation status at selected sites of the DNA of a patient,

(B) generating in said computing device a listing or ranked listing of diseases or medical conditions based on the information about the methylation status at selected sites of the DNA of the patient, the first knowledge base and the second knowledge base.

2. A method according to claim 1, further comprising:

a third knowledge base comprising a plurality of different therapeutic regimens for diseased cells or medical conditions,

a fourth knowledge base comprising a plurality of expert rules for evaluating and selecting therapeutic treatment regimens for diseased cells or medical conditions, and

(C) generating in said computing device a ranked listing of available therapeutic treatment regimens for said patient based on the information generated in step (B) and the third knowledge base and fourth knowledge base.

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Dep B2 3. A method according to claim 2, characterized in that the therapeutic regimen is a preventive therapeutic treatment regimen.

4. A method according to claim 2, further comprising:

a fifth knowledge base comprising advisory information useful for the treatment of a patient with different constituents of said different therapeutic treatment regimens; and

(D) generating in said computing device advisory information for one or more treatment regimens in said ranked listing based on the information generated in step (C) according to claim 2 and the fifth knowledge base.

5. A method according to claim 2, further comprising the steps of:

(E) entering a user-defined therapeutic treatment regimen for said disease or medical condition that is not included in said third knowledge base; and

(F) generating in said computing device advisory information for one or more user-defined combination therapeutic treatment regimen.

6. A method according to claim 1, in which said patient information in addition to the information about the methylation status at selected sites of the DNA comprises gender, age, weight, hemoglobin information, neuropathy information, neutrophil information, pancreatitis, hepatic function, renal function, drug allergy and intolerance information.

7. A method according to claim 1, wherein said patient information includes prior therapeutic treatment regimen information.

8. A method according to claim 1, wherein said patient information includes prior patient information stored in said computing device.

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9. A method according to claim 4, said advisory information including:
warnings to take the patient off a contraindicated drug before initiating a corresponding
therapeutic treatment regimen; and information clinically useful to implement a
corresponding therapeutic treatment regimen.

10. A method according to claim 1, wherein said computing device comprises a
sixth knowledge base comprising patient therapeutic treatment regimen history, said
advisory information including previous therapeutic treatment regimen information
extracted from said sixth knowledge base.

11. A method according to claim 1, wherein said disease or medical condition is a
cardiovascular disease, a pulmonary disease, a neurologic disease, cancer, diabetes, a
urinary tract infection, hepatitis or HIV infection.

12. A method according to claim 1, wherein drug dosage information is
recommended and adjusted if necessary depending upon said patient information.

13. A method according to claim 1, further comprising the step of:

(G) accessing, via said computing device, information for one or more therapeutic
treatment regimens from a drug reference source.

Sub B3 → 14. A method for treatment of a patient with a disease or medical condition, said
method comprising:

(A) isolating a DNA-containing sample from said patient;

(B) analyzing cytosine methylation patterns at selected sites of the DNA
contained in said sample;

(C) providing data about the methylation status at selected sites of the DNA of the
patient thereby creating a first knowledge base comprising said data, a second knowledge

base comprising information about a plurality of different methylation statuses at selected sites of the DNA in cells with a known disease or medical condition and/or healthy cells, a third knowledge base comprising a plurality of expert rules for evaluating and selecting a type of disease or medical condition based on the methylation status at selected sites of the DNA of a patient, and

(D) generating a ranked listing of diseases or medical conditions based on the data of the first knowledge base, the second knowledge base and the third knowledge base.

15. A method according to claim 14, in which the data is provided to a computing device.

16. A method according to claim 14, further comprising:

a fourth knowledge base comprising a plurality of different therapeutic regimens for diseased cells or medical conditions,

a fifth knowledge base comprising a plurality of expert rules for evaluating and selecting therapeutic treatment regimens for diseased cells or medical conditions, and

(E) generating a ranked listing of available therapeutic treatment regimens for said patient based on the information generated in step (D) according to claim 14 and the fourth knowledge base and the fifth knowledge base.

17. A method according to claim 16, characterized in that the therapeutic treatment regimen is a preventive treatment regimen.

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18. A method according to claim 16, further comprising:

a sixth knowledge base comprising advisory information useful for the treatment of a patient with different constituents of said different therapeutic treatment regimens; and

(F) generating advisory information for one or more specific treatment regimens in said ranked listing based on the information generated in step (E) according to claim 14 and the sixth knowledge base; and

(G) providing said one or more specific treatment regimens to said patient with a disease or medical condition based on the advisory information generated in step (F).

19. A method according to claim 16, further comprising the steps of:

(H) entering a user-defined therapeutic treatment regimen for said disease or medical condition that is not included in said fourth knowledge base; and

(I) generating advisory information for one or more user-defined combination therapeutic treatment regimen.

20. A method according to claim 14, in which said patient data in addition to the data about the methylation status at selected sites of the DNA comprises gender, age, weight, hemoglobin information, neuropathy information, neutrophil information, pancreatitis, hepatic function, renal function, drug allergy and intolerance information.

21. A method according to claim 14, wherein said patient data includes prior therapeutic treatment regimen information.

22. A method according to claim 14, wherein said patient data includes prior patient information stored in said computing device.

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23. A method according to claim 18, said advisory information including:
warnings to take the patient off a contraindicated drug before initiating a corresponding
therapeutic treatment regimen; and information clinically useful to implement a
corresponding therapeutic treatment regimen.

24. A method according to claim 18, comprising a seventh knowledge base
comprising patient therapeutic treatment regimen history, said advisory information
including previous therapeutic treatment regimen information extracted from said seventh
knowledge base.

25. A method according to claim 14, wherein said disease or medical condition is
a cardiovascular disease, a pulmonary disease, a neurologic disease, cancer, diabetes, a
urinary tract infection, hepatitis or HIV infection.

26. A method according to claim 14, wherein drug dosage information is
recommended and adjusted if necessary depending upon said patient information.

27. A method according to claim 14, further comprising the step of:

(J) accessing, via a computing device, information for one or more therapeutic
treatment regimens from a drug reference source.

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28. A system for guiding the selection of a therapeutic treatment regimen for a
patient with a disease or medical condition, said system comprising:

(A) a computing device comprising:

a first knowledge base comprising information about a plurality of
different methylation statuses at selected sites of the DNA in cells with a known disease
or medical condition and/or healthy cells,

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a second knowledge base comprising a plurality of expert rules for evaluating and selecting a type of disease or medical condition based on the methylation status at selected sites of the DNA of a patient,

(B) means for providing information about the methylation status at selected sites of the DNA of the patient to computing device;

(C) means for generating in said computing device a ranked listing of diseases or medical conditions based on the information about the methylation status at selected sites of the DNA of the patient, the first knowledge base and the second knowledge base.

29. A system according to claim 28, further comprising:

a third knowledge base comprising a plurality of different therapeutic regimens and/or preventive therapeutic treatment regimens for diseased cells or medical conditions,

a fourth knowledge base comprising a plurality of expert rules for evaluating and selecting therapeutic treatment regimens for diseased cells or medical conditions; and

(D) means for generating in said computing device a listing or ranked listing of available therapeutic treatment regimens for said patient based on the information generated according to claim 28, the third knowledge base and the fourth knowledge base.

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30. A system according to claim 28, further comprising:

a fifth knowledge base comprising advisory information useful for the treatment of a patient with different constituents of said different therapeutic treatment regimens; and

(E) means for generating in said computing device advisory information for one or more treatment regimens in said ranked listing.

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31. A system according to claim 29, further comprising:

(F) means for entering a user-defined therapeutic treatment regimen for said disease or medical condition that is not included in said third knowledge base; and

(G) means for generating in said computing device advisory information for one or more user-defined combination therapeutic treatment regimen.

32. A system according to claim 28, said patient information in addition to the information about the methylation status at selected sites of the DNA comprises gender, age, weight, hemoglobin information, neuropathy information, neutrophil information, pancreatitis, hepatic function, renal function, drug allergy and intolerance information.

33. A system according to claim 28, wherein said patient information includes prior therapeutic treatment regimen information.

34. A system according to claim 28, wherein said patient information includes prior patient information stored in said computing device.

35. A system according to claim 28, said advisory information including: warnings to take the patient off a contraindicated drug before initiating a corresponding therapeutic treatment regimen; and information clinically useful to implement a corresponding therapeutic treatment regimen.

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36. A system according to claim 28, wherein said computing device comprises a sixth knowledge base comprising patient therapeutic treatment regimen history, said advisory information including previous therapeutic treatment regimen information extracted from said sixth knowledge base.

37. A system according to claim 28, wherein said disease or medical condition is a cardiovascular disease, a pulmonary disease, a neurologic disease, cancer, diabetes, a urinary tract infection, hepatitis or HIV infection.

38. A system according to claim 28, wherein drug dosage information is recommended and adjusted if necessary depending upon said patient information.

39. A system according to claim 28, further comprising:

(H) means for accessing, via said computing device, information for one or more therapeutic treatment regimens from a standard drug reference source.

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40. A computer program product for guiding the selection of a therapeutic treatment regimen for a patient with a disease or medical condition, said computer program product comprising

a computer usable storage medium having computer readable program code means embodied in the medium, the computer readable program code means comprising:

(A) computer readable program code means for generating:

a first knowledge base comprising information about a plurality of different methylation statuses at selected sites of the DNA in cells with a known disease or medical condition and/or healthy cells,

a second knowledge base comprising a plurality of expert rules for evaluating and selecting a type of disease or medical condition based on the methylation

status at selected sites of the DNA of a patient,

a third knowledge base comprising a plurality of different therapeutic regimens and/or preventive therapeutic regimens for diseased cells or medical conditions,

a fourth knowledge base comprising a plurality of expert rules for evaluating and selecting therapeutic treatment regimens for diseased cells or medical conditions

a fifth knowledge base comprising advisory information useful for the treatment of a patient with different constituents of said different therapeutic treatment regimens; and

(B) computer readable program code means for providing information about the methylation status at selected sites of the DNA of the patient;

(C) computer readable program code means for generating a ranked listing of diseases or medical conditions based on the information about the methylation status at selected sites of the DNA of the patient; and

(D) computer readable program code means for generating in said computing device a ranked listing of available therapeutic treatment regimens for said patient.

41. A computer program product according to claim 40, further comprising:

(E) computer readable program code means for generating in said computing device advisory information for one or more treatment regimens in said ranked listing.

42. A computer program product according to claim 40, further comprising:

(F) computer readable program code means entering a user-defined therapeutic treatment regimen for said disease or medical condition that is not included in said third knowledge base;

(G) computer readable program code means for generating in said computing device advisory information for one or more user-defined combination therapeutic treatment regimen.

43. A computer program product according to claim 40, said patient information in addition to the information about the methylation status at selected sites of the DNA comprises gender, age, weight, hemoglobin information, neuropathy information, neutrophil information, pancreatitis, hepatic function, renal function, drug allergy and intolerance information.

44. A computer program product according to claim 40, said patient information including prior therapeutic treatment regimen information.

45. A computer program product according to claim 40, wherein said patient information includes prior patient information.

46. A computer program product according to claim 40, said advisory information including: warnings to take the patient off a contraindicated drug before initiating a corresponding therapeutic treatment regimen; and information clinically useful to implement a corresponding therapeutic treatment regimen.

47. A computer program product according to claim 40 wherein said computer readable program code means comprises computer readable program code means for generating a sixth knowledge base comprising patient therapeutic treatment regimen history, said advisory information including previous therapeutic treatment regimen

information extracted from said sixth knowledge base.

48. A computer program product according to claim 40, wherein said disease or medical condition is a cardiovascular disease, a pulmonary disease, a neurologic disease, cancer, diabetes, a urinary tract infection, hepatitis or HIV infection.

49. A computer program product according to claim 40, wherein drug dosage information is recommended and adjusted if necessary depending upon said patient information.

50. A computer program product according to claim 40, further comprising:

(H) computer readable program code means for accessing information for one or more therapeutic treatment regimens from a standard drug reference source.